

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Mr. P.G. Scott Born, Reg. # 40,523 on 7/2/09 and 7/9/09.
3. The specification is amended as follow:
 - a. Replacing "step 236" with --step 326-- on pg. 10, paragraph 31, line 6.
 - b. On pg. 11, replacing paragraph 33 with --When an object is requested within either a service object 207 or the directory service object 205 by a mobile agent object, the requested object generates auditing events and uses the auditing subsystem 220 to keep track of requested objects. As such, when an object is requested, an API 221 corresponding to the auditing subsystem 220 starts the event process, at step 410. The auditing subsystem 220 then logs the event into the audit database 230. Additionally, the auditing subsystem 220 sends a notification event to each of the auditing plugins 225, at step 423. The auditing plugins 225 may then use the API 221 of the auditing subsystem 220 to access the new data now stored in the audit database 230--.

4. Amending the claims as follow:

1. (Currently Amended) A method for a mobile agent object to discover services available in a host- computing environment, the method comprising:

the mobile agent object migrating from a first electronic device to a second electronic device comprising the host environment, the mobile agent object ~~operable~~configured to execute in the first electronic device, halt execution in the first electronic device at an execution state, be transplanted to the second electronic device, and resume execution from the execution state in the second electronic device;

after the mobile agent object migrates to the second electronic device, the mobile agent object requesting a service listing from the host environment;

the host environment returning a service listing to the mobile agent object in response to the request for the service listing;

the mobile agent object determining if a particular service is within the returned service listing; ~~and~~

the mobile agent object requesting the particular service if the particular service is determined by the mobile agent object to be within the returned service listing;

an audit system generating an audit event in response to the request for the particular service; and

the audit system logging the audit event in a database.

2. (Original) The method of claim 1, further comprising the mobile agent object moving to a computing environment other than the host-computing environment in response to determining that the particular service is not within the returned service listing.

3. (Original) The method of claim 1, further comprising
the host environment providing the particular service to the mobile agent object;
and the mobile agent object incorporating the particular service.
4. (Original) The method of claim 3, further comprising the mobile agent object
moving to a computing environment other than the host-computing environment in
response to incorporating the particular service.
5. (Original) The method of claim 3, further comprising
the mobile agent object determining if a second particular service is within the
returned service listing;
the mobile agent object requesting the second particular service if the second
particular service is determined by the mobile agent object to be within the returned
service listing;
the host environment providing the second particular service to the mobile agent
object; and
the mobile agent object incorporating the second particular service.
6. (Original) The method of claim 3 wherein the incorporated service comprises
data.
7. (Original) The method of claim 3 wherein the incorporated service comprises a
process.
8. (Cancelled).

9. (Currently Amended) The method of claim [[8]] 1, further comprising the audit system notifying at least one audit plug-in in response logging the audit event.
10. (Original) The method of claim 9, further comprising the audit plug-in retrieving data from the database in response to the notifying.
11. (Cancelled).
12. (Currently Amended) The method of claim [[8]] 1 wherein the generating an audit event comprises communicating with a processor in the host-computing environment using an application program interface.
13. (Currently Amended) The method of claim [[8]] 1, further comprising:
 - the audit system detecting a second request for a service by a mobile agent object;
 - the audit system generating a second audit event in response to detecting the second request; and
 - the audit system logging the second audit event in a database.
14. (Cancelled).
15. (Currently Amended) The method of claim [[14]] 1, further comprising:
 - the host-computing environment providing the particular service to the mobile agent object; and
 - the mobile agent object incorporating the particular service.

16-17. (Cancelled).

18. (Currently Amended) A computer system for hosting a mobile agent object having discovery ability, the computer system comprising:

a processor ~~operable~~configured to facilitate communications between computer systems coupled by a network; and

a memory coupled to the processor, the memory comprising:

a mobile-agent runtime environment ~~operable~~configured to host a mobile agent object after the mobile agent object migrates to the computer system, the mobile agent object ~~operable~~configured to execute in a first electronic device, halt execution in the first electronic device at an execution state, be transplanted to ~~a second electronic device~~the computer system, and resume execution from the execution state in the ~~second electronic device~~computer system;

a discovery service object ~~operable~~configured to list service objects available to ~~[[a]]~~ the mobile agent object in response to a discovery request from the hosted mobile agent object; ~~and~~

at least one service object ~~operable~~configured to interact with the mobile agent object in response to a request for the at least one service object by the mobile agent object; ~~and~~

an audit system within the mobile-agent runtime environment configured to generate an audit event in response to the request for the at least one service object and log the audit event in a database.

19. (Currently Amended) The system of claim 18, further comprising an injector

process within the memory, the injector process ~~operable~~configured to launch the mobile agent object in the mobile agent runtime environment.

20. (Original) The system of claim 18 wherein the at least one service object comprises data.

21. (Original) The system of claim 18 wherein the at least one service object comprises a process.

22. (Original) The system of claim 18 wherein the at least one service object comprises a second mobile agent object.

23. (Original) The system of claim 18 wherein the at least one service object comprises a second discovery service object.

24. (Currently Amended) A system for auditing the activity of a mobile agent object in a host-computing environment, the system comprising:

a processor ~~operable~~configured to facilitate communications between the host-computing environment and other computing environments coupled by a network;
and

a memory coupled to the processor, the memory comprising:

a first mobile-agent runtime environment configured to host a mobile agent object after the mobile agent object migrates to the first mobile-agent runtime environment from one of the other computing environments, the mobile agent object configured to execute in one of the other computing environments, halt execution in

one of the other computing environments at an execution state, be transplanted to the first mobile-agent runtime environment, and resume execution from the execution state in the first mobile-agent runtime environment;

a discovery service object configured to list service objects available to the mobile agent object in response to a discovery request from the hosted mobile agent object;

Deleted:

at least one service object configured to interact with the mobile agent object in response to a request for the at least one service object by the mobile agent object;

an audit system operable configured to detect [[a]] the request for [[a]] the at least one service object by the hosted mobile agent object in the first mobile-agent runtime environment, the service object being implemented in the host-computing environment; and

an audit database operable configured to log the request for the at least one service object by the mobile agent object in response to the audit system detecting the request.

25. (Currently Amended) The system of claim 24 wherein the audit system is operable configured to generate a notification in response to detecting of the request.

26. (Currently Amended) The system of claim 25, further comprising at least one audit plug-in operable configured to retrieve data from the audit database in response to a notification from the audit system.

27. (Currently Amended) The system of claim 24, further comprising a network

interface controller ~~operable~~configured to facilitate the movement of the mobile agent object from the first mobile-agent runtime environment to a second mobile-agent runtime environment.

28. (Original) The system of claim 27 wherein the second mobile-agent runtime environment resides in a memory of one of the other computing environments.

29. (Original) The system of claim 27 wherein the second mobile-agent runtime environment resides in a second memory in the host-computing environment.

30. (Original) The system of claim 27 wherein the second mobile-agent runtime environment resides in a portion of the memory in the host-computing environment other than the portion of the memory where the first mobile-agent runtime environment resides.

31. (Currently Amended) A system for hosting a mobile agent object having discovery ability, the system comprising:

a first host-computing environment comprising:

a first processor ~~operable~~configured to facilitate communications to and from a computer network; and

a first memory coupled to the first processor, the first memory comprising:

a first mobile-agent runtime environment ~~operable~~configured to host a mobile agent object after the mobile agent object migrates to the first host-computing environment, the mobile agent object ~~operable~~configured to execute in a first electronic device, halt execution in the first electronic device at an execution state, be

transplanted to a second electronic device, and resume execution from the execution state in the second electronic device;

a first discovery service object having an application programming interface for communicating with the first processor in response to a discovery request from the mobile agent object and to return a listing of available service objects to the mobile agent object in response to the discovery request; and

a first service object within the first mobile-agent runtime environment ~~operable~~configured to interact with the mobile agent object in response to a request for the first service object by the mobile agent object based on the returned listing;

an audit system configured to generate an audit event in response to the request for the first service object and log the audit event in a database, and

a second host-computing environment coupled to the first host-computing environment by the computer network, the second host-computing environment comprising:

a second processor ~~operable~~configured to facilitate communications to and from the first host-computing environment; and

a second memory coupled to the second processor, the second memory comprising:

a second mobile-agent runtime environment ~~operable~~configured to host the mobile agent object after the mobile agent object migrates to the second host-computing environment;

a second discovery service object having an application programming interface for communicating with the second processor in response to a discovery request from the mobile agent object; and

a second service object within the second mobile-agent runtime environment ~~operable~~configured to interact with the mobile agent object in response to a request for the second service object by the mobile agent object.

32. (Currently Amended) A ~~computer-readable medium~~ memory having stored thereon instructions that when executed by a computing device perform the steps of:

receiving from a mobile agent object a request for a service listing after the mobile agent object migrates to the computing device, the mobile agent object ~~operable~~configured to execute in a first electronic device, halt execution in the first electronic device at an execution state, be transplanted to a second electronic device, and resume execution from the execution state in the second electronic device;

returning a service listing to the mobile agent object in response to the request for the service listing; ~~and~~

receiving from the mobile agent object a request for a particular service listed in the returned service listing;

generating an audit event in response to the request for the particular service;
and

logging the audit event in a database.

33. Canceled.

Reasons for Allowance

5. The following is an examiner's statement of reasons for allowance:

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6. The prior arts of record do not expressly teach or render obvious, in the context of the claims taken as a whole, the invention as recited in independent claims 1, 18, 24 and 31-32.

7. Migration of mobile agent objects from one device to another was disclosed in US Patent 6,016,393. Performing service discovery by a mobile agent object was disclosed in “Combine concept of agent and service to build distributed object-oriented system” to Li et al. and “Service discovery in a mobile agent API using SLP” to Barbeau. Auditing, tracking or logging of service usage was disclosed in US Patent 7,016,966. The references do not expressly teach or render obvious the migration of the mobile agent object, invocation of service discovery in a destination host environment by the mobile agent object after the mobile agent object migrates to the destination host environment, requesting a particular service of the discovered services and auditing the service requested by the mobile agent object taken as a whole as recited in independent claims 1, 18, 24 and 31-32.

8. Neither a reference uncovered that would have provided a basis of evidence for asserting a motivation, nor one of ordinary skilled in the art at the time the invention was made, knowing the teaching of the prior arts of record would have combined them to arrived at the present invention as recited in the context of independent claims 1, 18, 24 and 31-32 as a whole.

9. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

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fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qing-Yuan Wu whose telephone number is (571)272-3776. The examiner can normally be reached on 8:30am-6:00pm Monday-Thursday and alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung (Sam) Sough can be reached on (571) 272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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07/18/09

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